Game Changing Development

Continuous Electrochemical Gas Separation

Completed Technology Project (2014 - 2016)

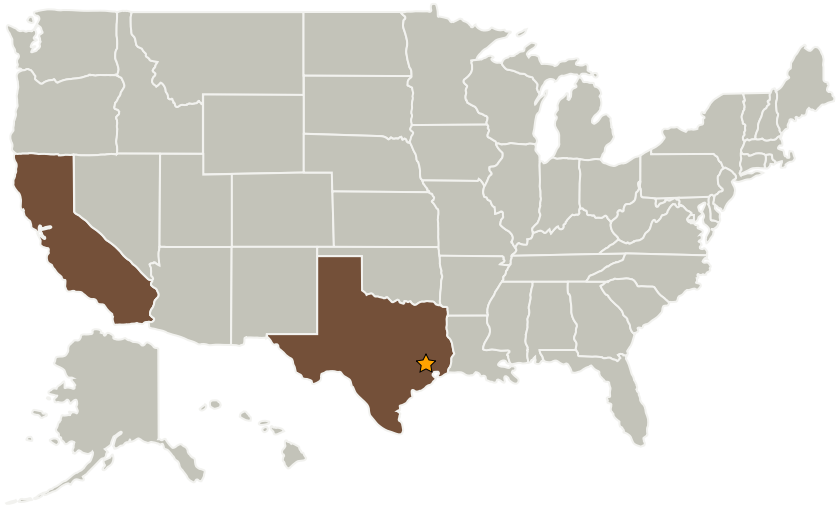
Project Introduction

State-of-the-art carbon dioxide removal technology is heavy and requires considerable power. This novel approach is based on an electrochemical membrane technology that incorporates ionic liquids. It uses only electricity to drive the separation, with no moving parts or pressure drops and CO2 can be collected for oxygen recovery.

Anticipated Benefits

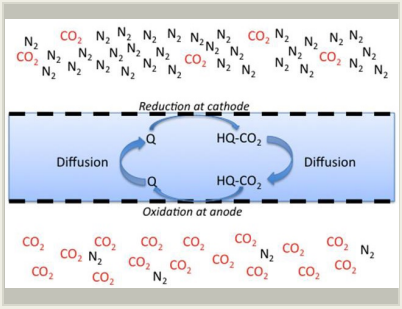
This project hopes to improve carbon dioxide removal technology, which could be beneficial to future human space flight.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
California	Texas



CO2 is transported from a low concentration (cathode side) to a high concentration (anode side) by reaction with an electrochemically active carrier. CO2 is bound to a reduced form of the carrier, and is released when the carrier is oxidized.

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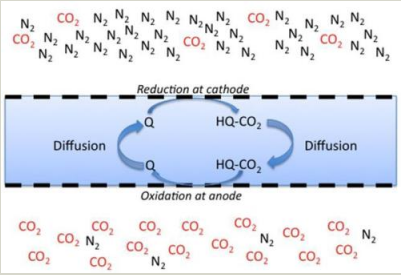
Project Transitions

September 2014: Project Start

August 2016: Closed out

Images



Electrochemical Membrane Separation Process
CO2 is transported from a low concentration (cathode side) to a high concentration (anode side) by reaction with an electrochemically active carrier. CO2 is bound to a reduced form of the carrier, and is released when the carrier is oxidized.
(https://techport.nasa.gov/image/143237)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Center / Facility:
Johnson Space Center (JSC)

Responsible Program:
Game Changing Development

Project Management

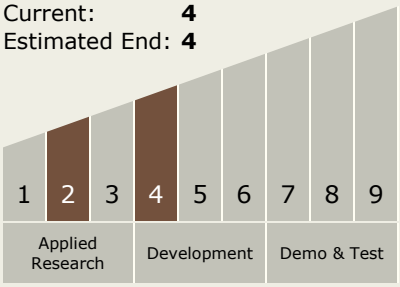
Program Director:
Mary J Werkheiser

Program Manager:
Gary F Meyering

Principal Investigator:
Daniel J Barta

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Target Destination

Foundational Knowledge